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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,991	09/07/2006	Yasushi Noguchi	129357	6419

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EXAMINER	
KEMMERLE III, RUSSELL J	
ART UNIT	PAPER NUMBER
1791	
MAIL DATE	DELIVERY MODE
02/02/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,991	NOGUCHI ET AL.	
	Examiner	Art Unit	
	RUSSELL J. KEMMERLE III	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) *10-12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07 September 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of group I claims 1-9 in the reply filed on 12 November 2008 is acknowledged. The traversal is on the ground(s) that the subject matter of claims 1-12 is sufficiently related that a thorough search for the subject matter of any one group would encompass a search for the subject matter of the remaining claims. This is not found persuasive because the claims are broken into groups of a method of forming a porous ceramic structure and a porous ceramic structure. Because they are directed to different classes of invention, the area of search would have to be tailored to the different groups, and the searches would involve searching in different areas. A search for the process of group I would not necessarily involve a search of products that may be made by such a process since the product produced may have no bearing on the patentability of the process of making such a product. A similar argument can also be made for why a search for a product may not necessarily encompass a search for a method of making such a product.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites that the mixing and kneading step occurs at a "pressure of -40000 Pa to -93000 Pa". It is unclear how a negative pressure can be obtained, since a pressure of 0 Pa would mean a complete absence of any matter in the chamber. Since even that can not be practically obtained, it is unclear how even more matter could be removed from the chamber in order to create a negative pressure.

Specification

The disclosure is objected to because of the following informalities: the specification contains references to a negative pressure during the mixing and kneading step. As discussed above in the rejection under 35 U.S.C. §112 ¶ 2, it is unclear how such a pressure is possible.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumazawa (US Published Application 2002/0,180,119) in view of Noguchi (US published Application 2003/0,041,574).

Kumazawa discloses a method of making a ceramic honeycomb where a mixture of cordierite forming raw materials are mixed with a forming agent (pore former) and water (a dispersion medium). This mixture is then extruded to form a green ceramic honeycomb structure, which is dried and fired (page 2 paragraph 13).

Kumazawa discloses that the raw materials are subjected to spray drying before mixing (page 2, paragraph 13). One of ordinary skill in the art would understand that due to the nature of spray drying, the result is a particle that is almost perfectly spherical (circularity close to 1).

Kumazawa does not disclose that the pore forming agent be hollow particles.

Noguchi discloses a method of making a ceramic honeycomb structure substantially similar to the process of Kumazawa (abstract). Noguchi discloses the use

of expanded foam resins (such as acrylic microcapsules) as the pore forming agent, which are hollow and provide high porosity while restraining heat liberation during firing.

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have modified the method Kumazawa by using the hollow microcapsule pore formed of Noguchi. This would have been obvious because Noguchi discloses that the use of such pore formers results in high porosity while restraining heat liberation during firing, which can lead cracks and other defects in the finished product.

Referring to claim 6, Kumazawa discloses that the cordierite forming raw materials may include talc, kaolin, calcined kaolin, alumina, aluminum hydroxide, and silica (page 2 paragraph 13). Since they are all spray dried prior to mixing, they would all contain mostly spherical particles.

Referring to claim 8, Kumazawa discloses that the particles used by 45 μm or less (page 2, paragraph 13).

Claims 1-4, 6, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumazawa in view of Noguchi and Suzuki (US Patent 5,087,278).

Kumazawa and Noguchi are relied upon as discussed above, but do not disclose the level of circularity of the ceramic particles, or that the spheres are formed by heating the particles to between the materials melting temperature and 300°C above the melting temperature. Specifically, they do not disclose that silica spheres are formed by heating to 1730-2030°C.

Suzuki discloses a method of forming a porous ceramic article. Suzuki specifically discloses that it is preferable that the ceramic powders be spherical so as to minimize the number of contact points between particles to more easily produce a porous body (Col 3 lines 46-49). Suzuki further discloses that the particles should be as close to a perfect sphere as possible (circularity close to 1) (Col 3 lines 53-56).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have modified the method of Kumazawa in view of Noguchi by using spherical particles as taught by Suzuki. This would have been obvious because Suzuki discloses that spherical particles more easily create a porous body with higher strength than a body made with particles of other shapes.

Referring specifically to claims 4 and 7, Suzuki discloses making silica spheres by contacting silica particles with a flame at a temperature of around 2,000-2,200°C (Col 8 lines 22-29).

Suzuki further discloses that melt-sphered silica powder having an average diameter of up to 5 μm is effective for such applications (Cols 15-18, Table 2).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kumazawa in view of Noguchi and Suzuki in further view of Guerfi (US Published Application 2004/0,053,050).

Kumazawa, Noguchi and Suzuki are relied upon as discussed above, but do not disclose that the spherical particles are obtained by crushing the particles with a jet air current.

Guerfi discloses a known method of forming a spherical particle out of an irregularly shaped particle that involves jet air grinding (page 5 paragraph 80).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have modified the method of Kumazawa, Noguchi and Suzuki as discussed above by using jet air grinding to obtain spherical particles as taught by Guerfi. This would have been obvious because both the melt-sphereing of Suzuki and the jet air grinding of Guerfi are both method of forming a spherical particle out of an irregularly shaped one, and one of ordinary skill in the art would expect them to operate in similar manners to obtain a similar result.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RUSSELL J. KEMMERLE III whose telephone number is (571)272-6509. The examiner can normally be reached on Monday through Thursday, 7:00-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit 1791

/R. J. K./
Examiner, Art Unit 1791